

Ministry of Agriculture and Rural Development
VIETNAM DISASTER MANAGEMENT AUTHORITY

Disaster Management Policy and Technical Center

SPACE TECHNOLOGY APPLICATION FOR DISASTER MANAGEMENT IN VIETNAM

Hanoi, Mar 21th 2018

Typhoon Tembin – Dec 24th 2017
Source: internet

Content:



Introduction



The initial result

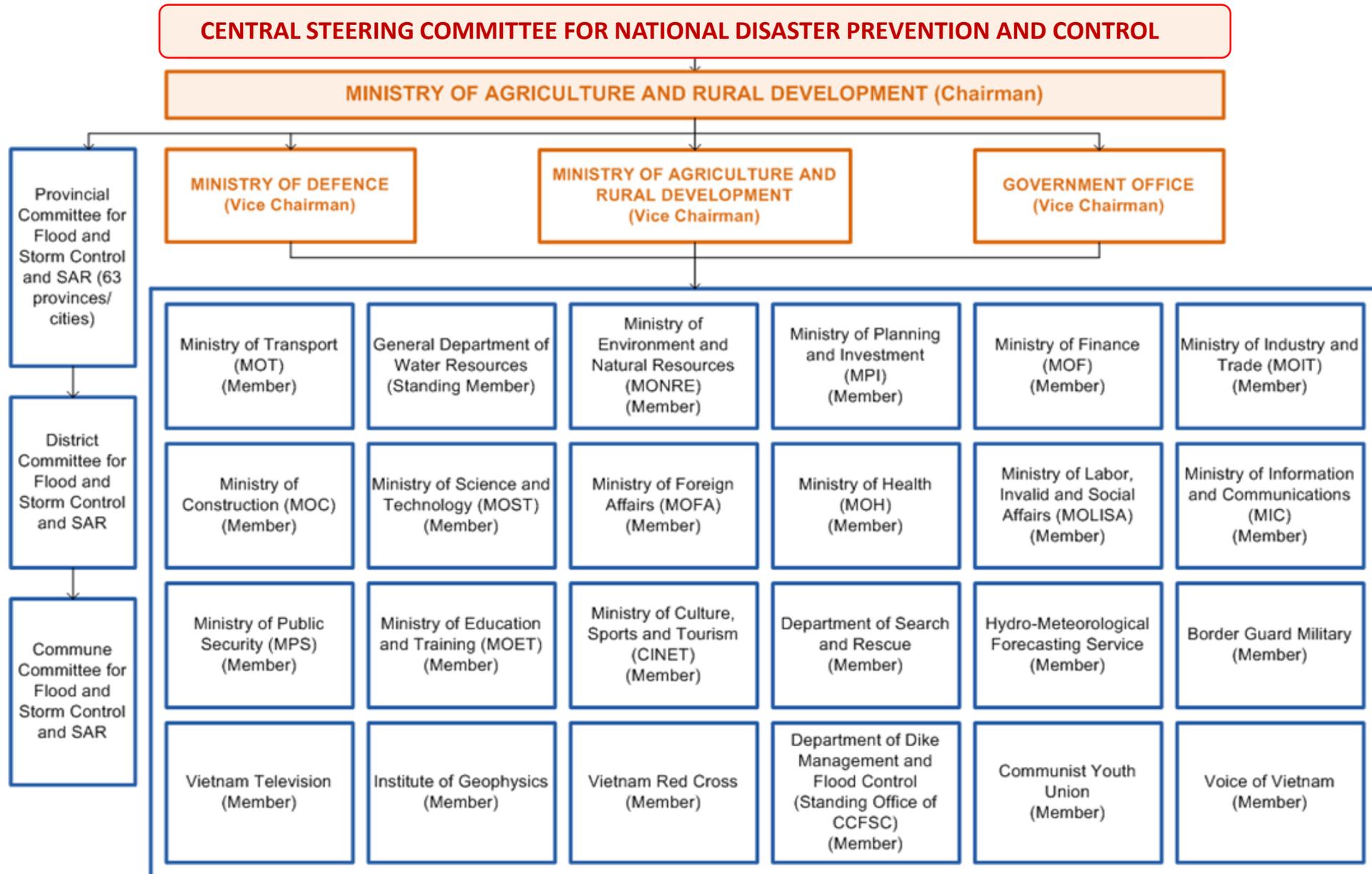


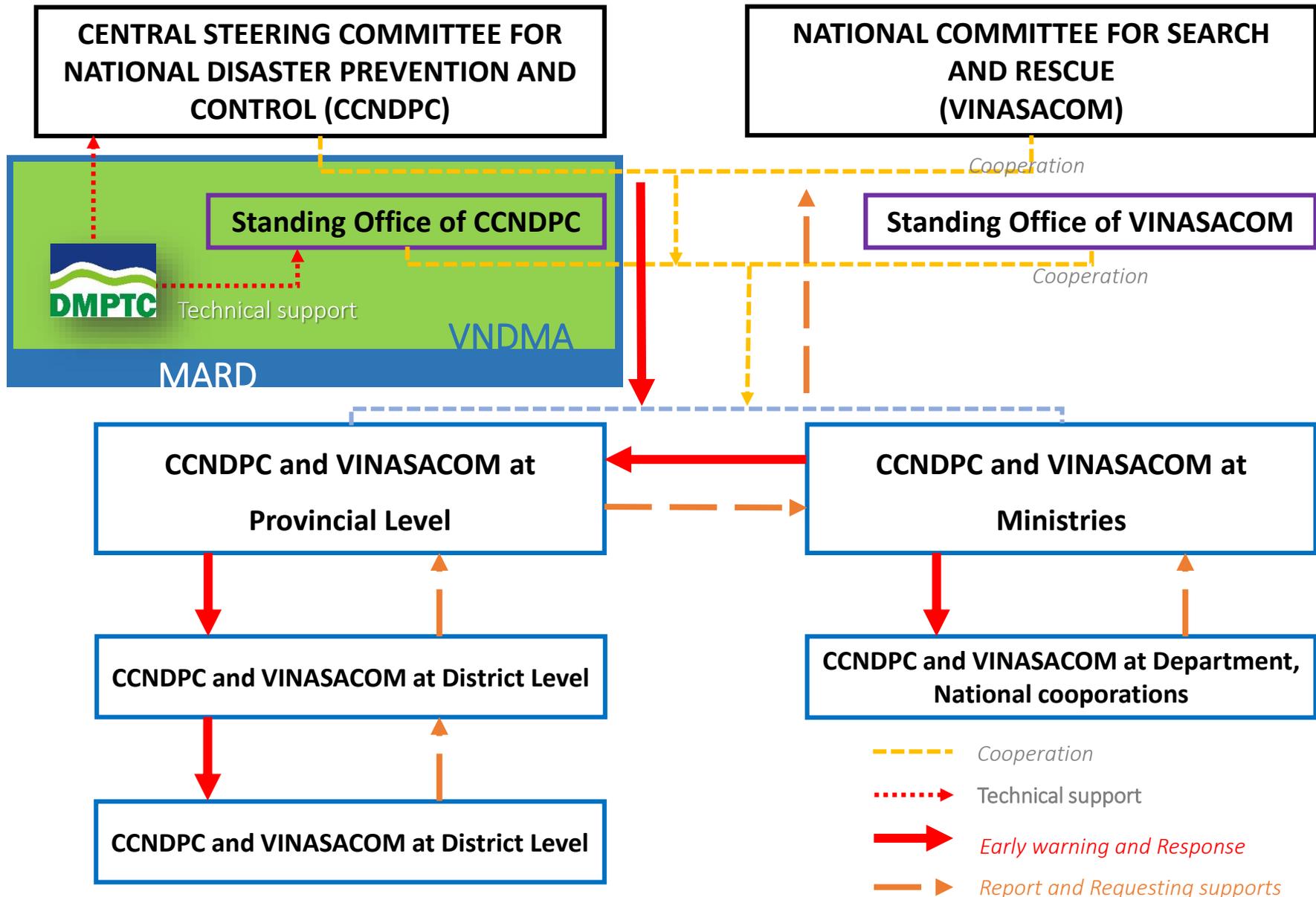
Recommendation

INTRODUCTION

1. Disaster Management Center (DMC) had been established in 2010 by Prime Minister of Ministry of Agriculture and Rural Development (MARD).
2. The functions and mission of DMC had been regulated in the Decision as below:
 - At the Decision No. 14/QĐ – TCTL dated 31/3/2010 of the Director of Water Resource Directorate (WRD) - MARD
 - At the Decision No. 16/QĐ – TCTL dated 09/01/2015 of the Director of Water Resource Directorate (WRD) - MARD
 - At the Decision No. 19/QĐ – PCTT dated 18/8/2017 of the Director of Viet Nam Disaster Management Authority (VNDMA) - MARD
3. Main function: [Technical supporting](#) for VNDMA and Central Committee for Nature Disaster Prevention and Control (CCNDPC) for disaster management.

Disaster management structure in Vietnam



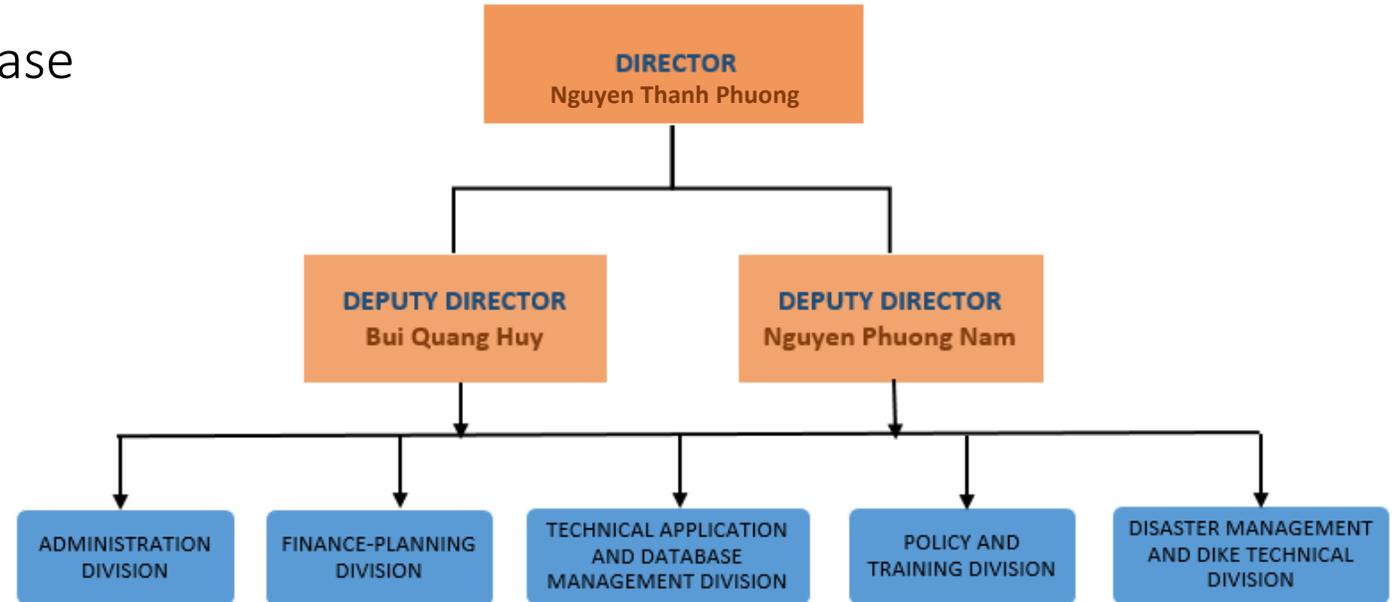


DMPTC position in the Disaster Management Systems

Organization structure

05 Division

- Technical Application and Database Management Division
- Policy and Training Division
- Disaster Management and Dike Technical Division
- Administration Division
- Finance-Planning Division



functions

1. To build, manage and exploit specialized databases on disaster management and dyke management and response to climate change, sea level rise under the management of the Authority.
2. To build, examine and verify disaster management plans; disaster response plans in line with disaster risk levels; strong and super typhoon response plans; emergency response plans in cases of floods exceeding design frequencies, dyke and dam failures or other emergencies that might occur; reservoir operation and regulation; dyke management maps, flood maps and other maps which serve disaster management and response to climate change, sea level rise.
3. To conduct observation, monitoring, basic investigation, baseline assessment, scientific and technical researches; to build pilot models and works using new building materials, applying information and remote sensing technology; applying, testing and transferring new technologies and scientific and technological advances in disaster risk management and response to climate change, sea level rise.
4. To co-operate with domestic and international organizations and agencies in technical cooperation, applying information technologies and geo-space information technologies, sharing information and experiences on disaster risk management and response to climate change, sea level rise according to legislation.
5. Policy consultant and guidance on safety, environment, gender mainstreaming and integrate vulnerable subjects, analyze and evaluate the impacts of policies in the field in the field of natural disaster prevention and control and cope with climate change, sea level rise
6. Developing investment projects, designing construction works on dike, riverbank protection works, flood drainage, disaster warning works, storm shelters for vessel and works, technical infrastructure related to dykes, natural disaster prevention (bridge, port, road ...). Survey, investigation and collect data on terrain, geology, hydrology, marine for disaster prevention, dyke, response to climate change, sea level rise and construction investment consultancy, planning.

Milestones of applying space technology in Vietnam

Present & further

2017

- Cooperation to organization the 10 years anniversary workshop and the 4th JPTM meeting in Hanoi (2017)

2016

- **4th: Request/ activation SA:** for two flood event in October & November, 2016 in the central area of Vietnam.
- **3rd: Request / activation SA:** DMC collaborated with STI for processing, mapping, survey and report (BIG DROUGHT 10-11/2016, Central Coastal province of Viet Nam)
- **2nd : Request / activation SA:** DMC collaborated with STI for processing, mapping, survey and report (BIG DROUGHT 2015-2016, Central Highland of Viet Nam)

2015

- **Sign MOU between JAXA, WRD, VAST (September 2015); Building Implementation plans for 3 years of MOU**
- JAXA & Disaster Charter: **1st Request / activation:** Collected Data, products from Sentinel Asia, Disaster Charter, Vietnamese DANs, AIT, Tokyo University. DMC collaborated with STI for processing, mapping, survey and report (BIG Flooding 2014, Quang Ninh province)

2014

- UNSPIDER and GITA' technical Advisory Group to Vietnam (September 2014)

2013

- UN-SPIDER Technical Advisory Mission to Vietnam (March 2013)

UN-SPIDER Technical Advisory Mission to Vietnam – Mar 2013



Memorandum of Understanding signing ceremony – Sep 2015

(WRD) – (MARD) & (VAST) & (JAXA)

The Parties cooperate and make efforts on the following activities;

- ❑ Development of a database system by past satellite imageries of Vietnam for disaster prevention.
- ❑ Exchange of satellite data when disaster happens. *(JAXA will provide satellite data owned by JAXA, such as, including but not limited to, ALOS-2 data for WRD and/or VAST upon request of WRD and/or VAST through Sentinel Asia. VAST will provide satellite data owned by VAST, such as, including but not limited to, VNREDSat, for Sentinel Asia Step 3 Activities..)*
- ❑ Strengthening the capacity of application of remote sensing and GIS technology for disaster prevention in Vietnam.
- ❑ Development of programs and projects on application of remote sensing and GIS technologies for disaster prevention.

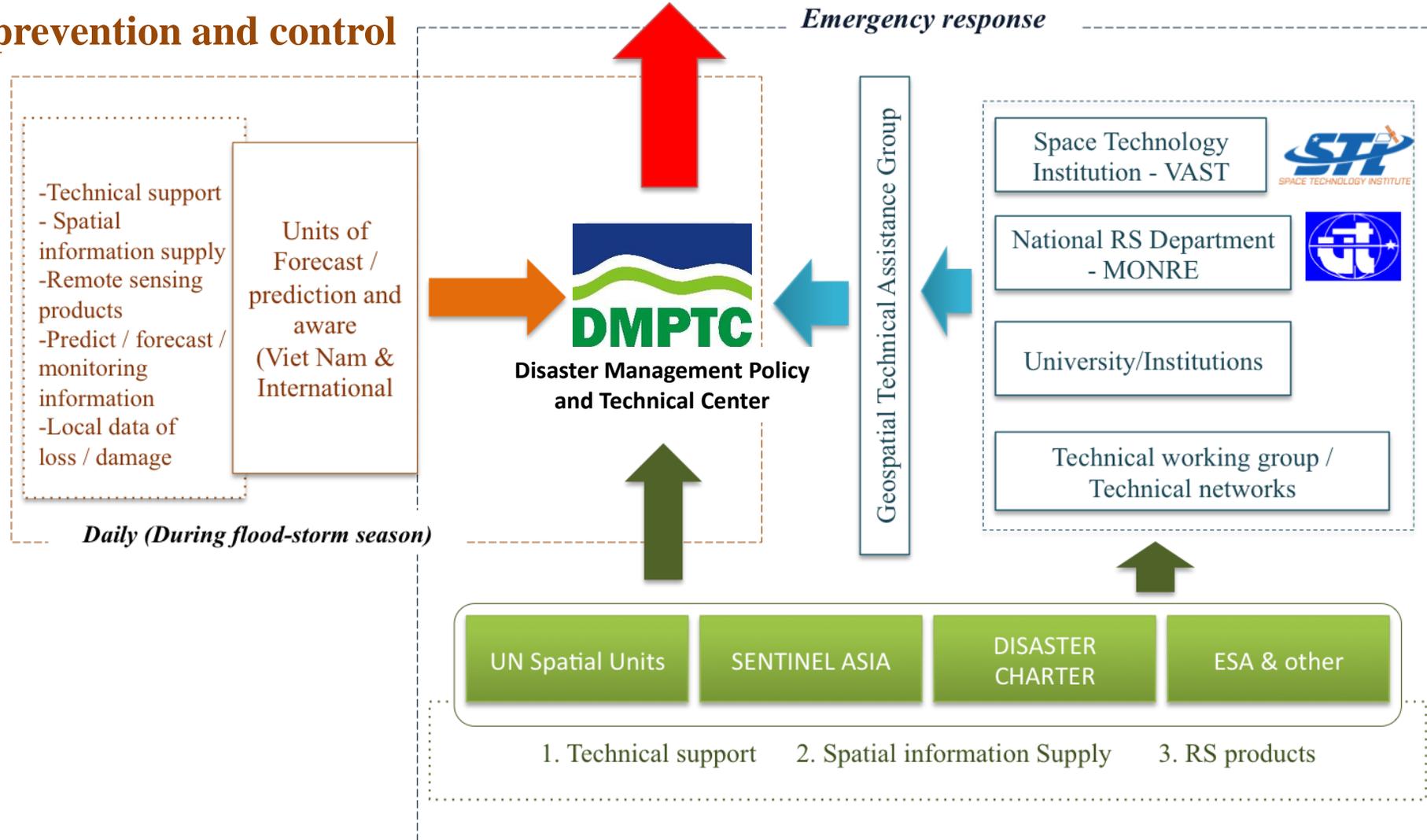


According to the MoU, DMC will be the focal point of WRD in this activities and STI will be the focal point of VAST.

The structure for receipt RS and GIS to serve for disaster prevention and control



Standing Office of National Committee for Disaster prevention and Control

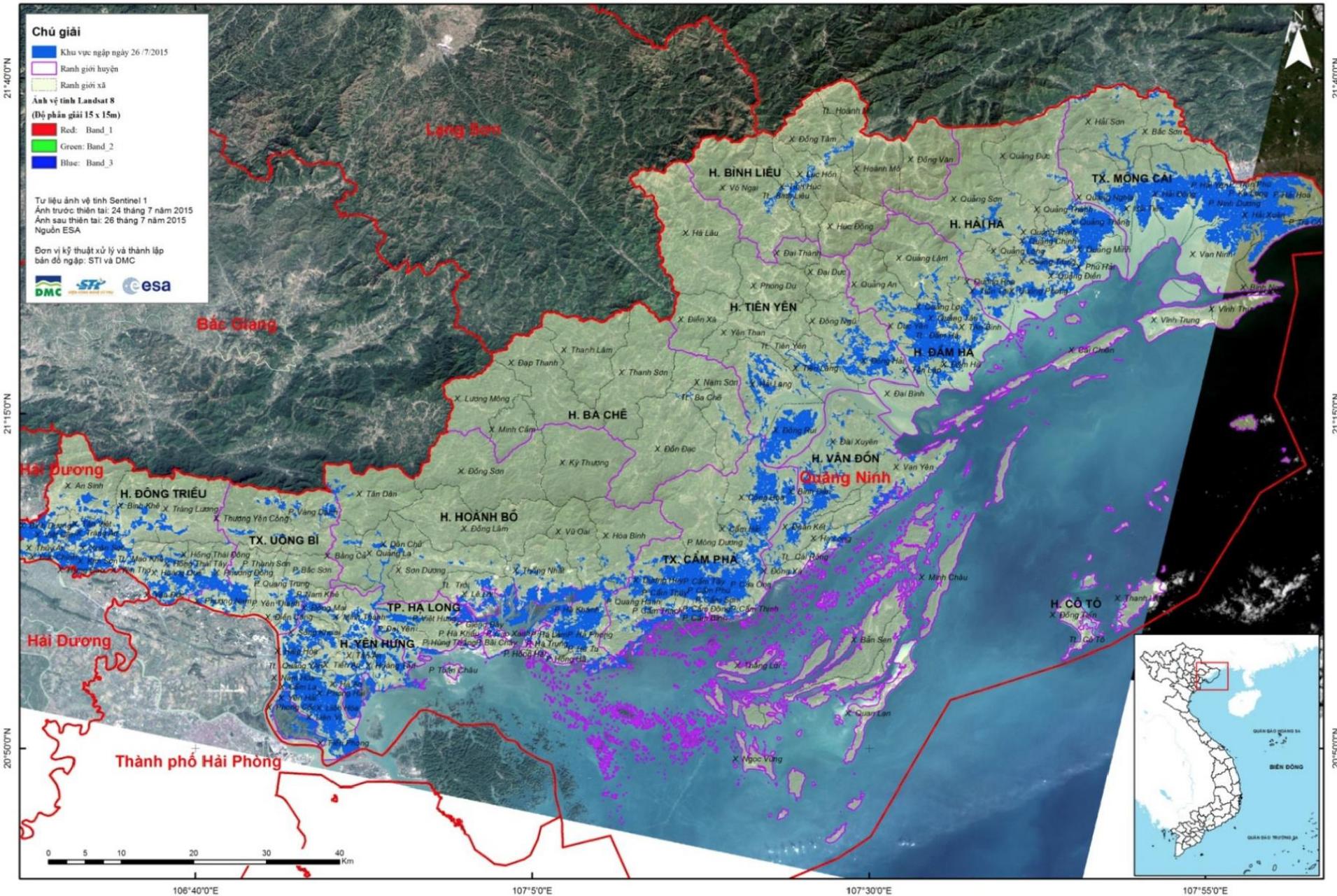


THE INNITIAL RESULT

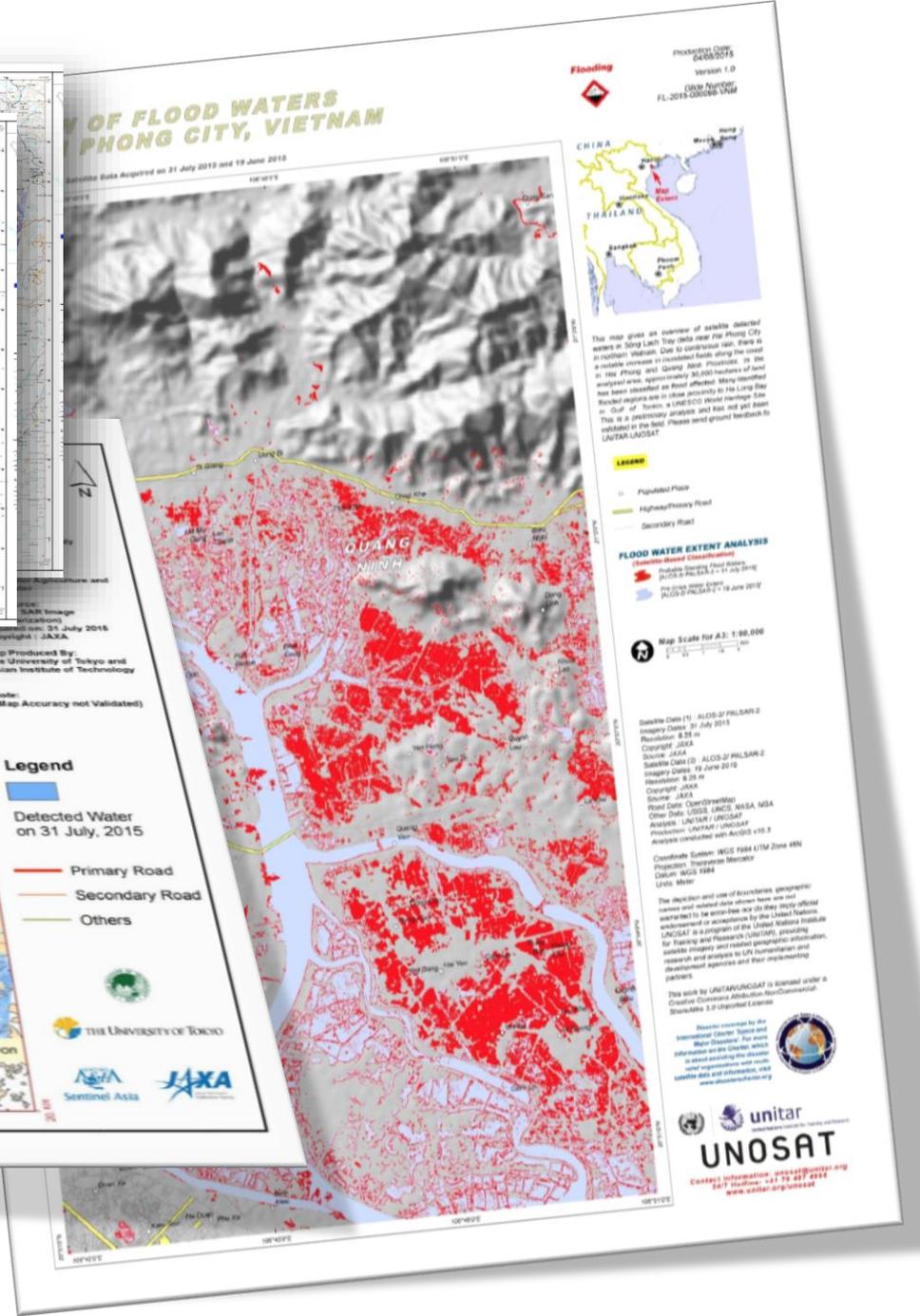
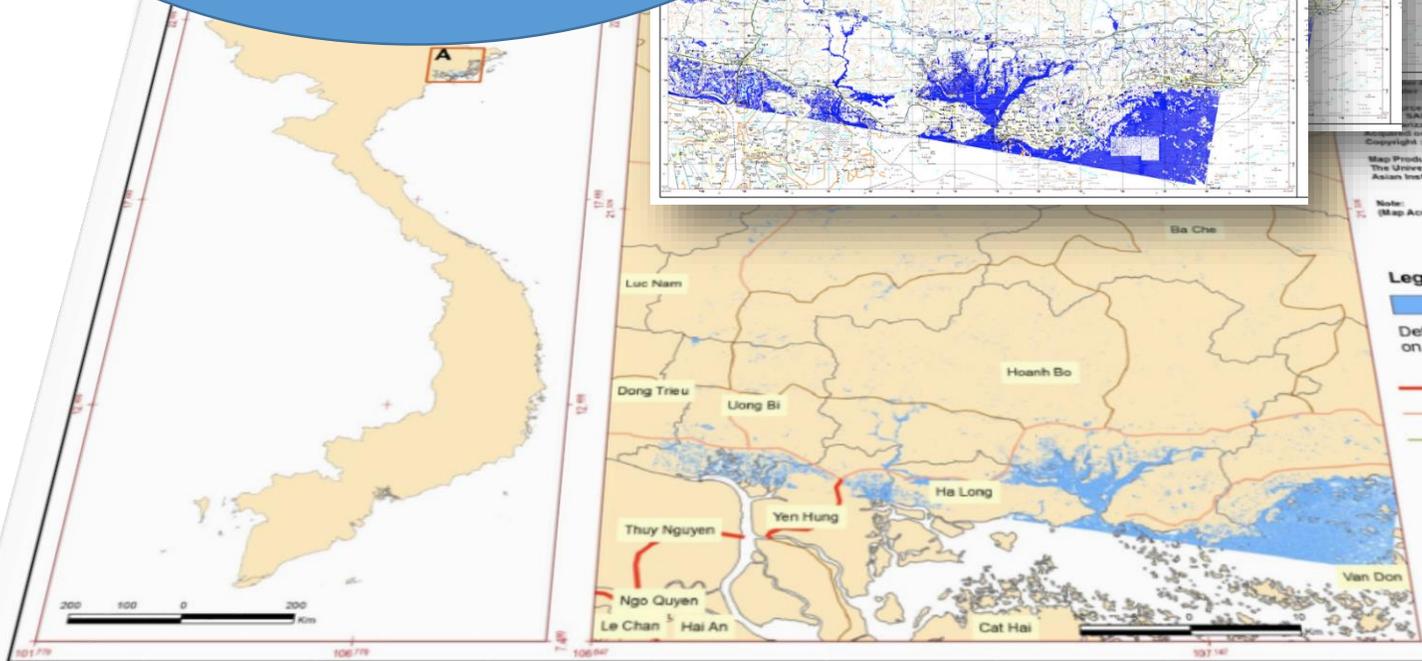
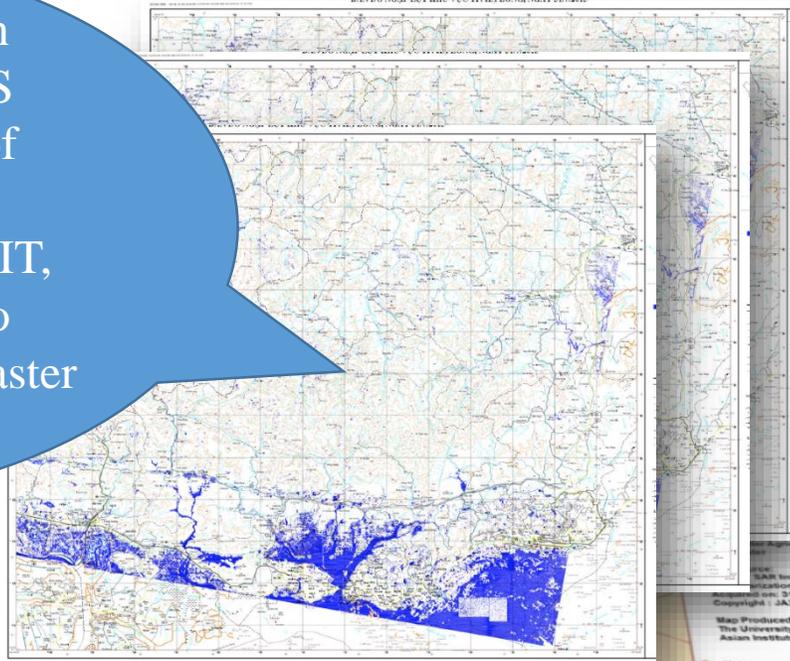
- Emergency response for Flood disaster on 2015

Inundation map in Quang Ninh province, 26/7/2015.

DMPTC and Spatial Technology Institution (STI) had cooperated in developing inundation map by heavy rain in Quang Ninh province (26/7/2015) using satellite image of Sentinel 1 (SAR)



Inundation Map had been produced by National RS Department of Ministry of Natural Resources and Environment (MONRE), AIT, UNOSAT for reporting to National Committee for Disaster Prevention and Control



THE INNITIAL RESULT

- Response for drought disaster on 2016

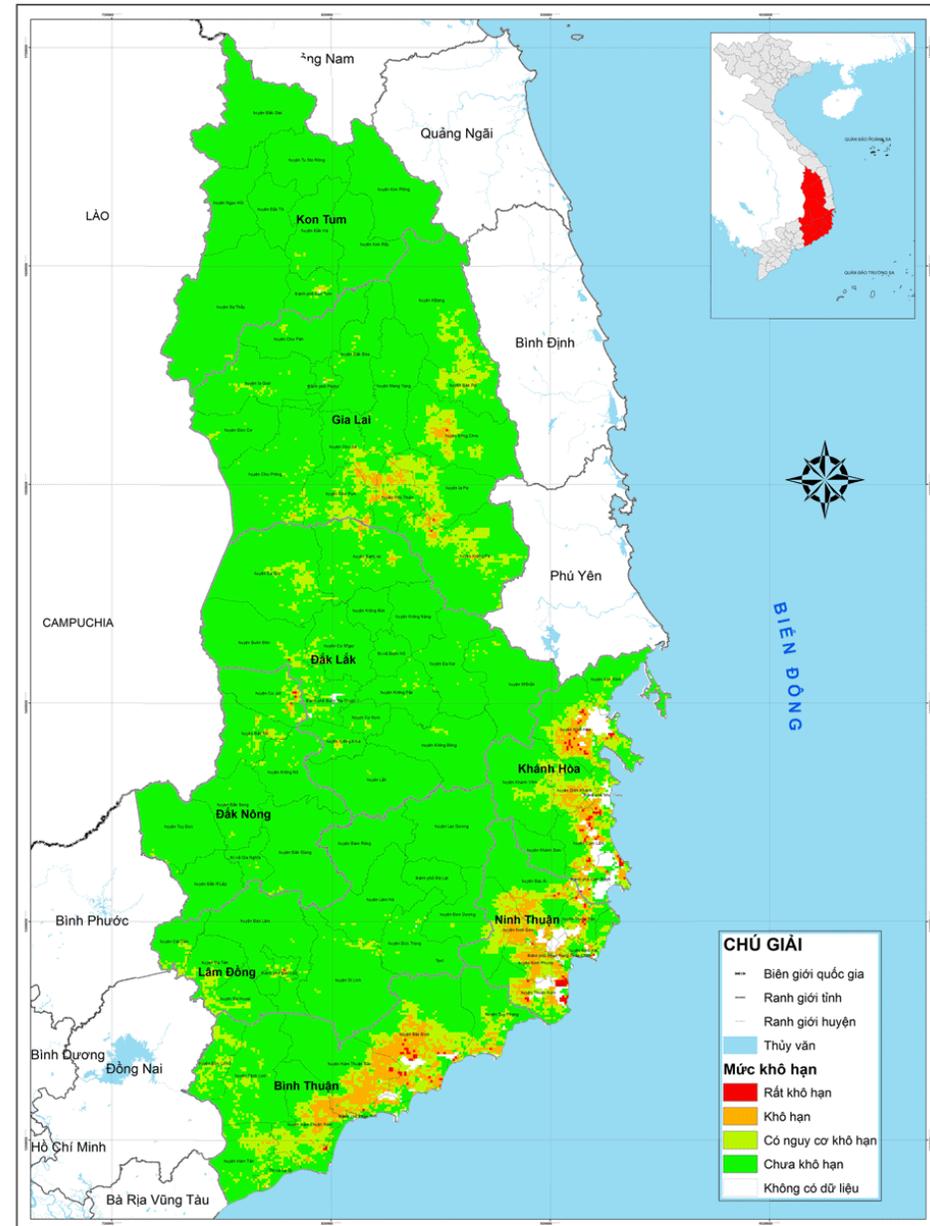
Results

from MODIS satellite images

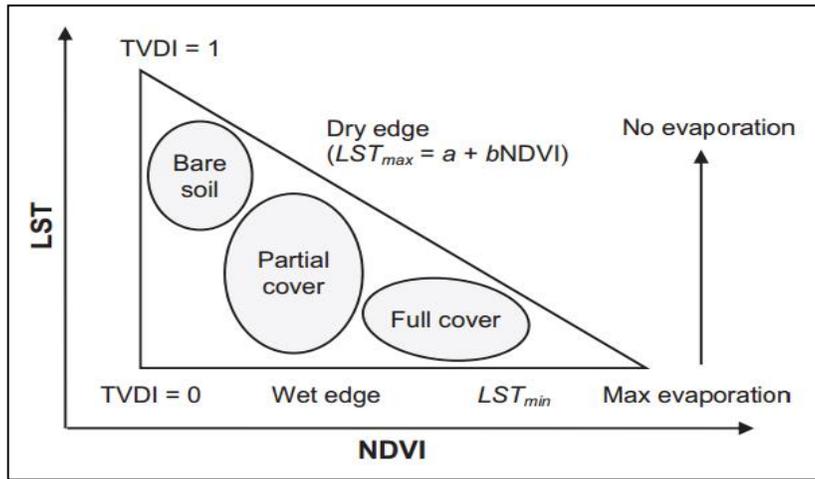


(adapted from Mauro E. Hořman và Raúl E. Rivas, 2015)

Drought level	TVDI value	Warning color
Severe drought	0,7 – 1	
Moderate drought	0,55 – 0,7	
Slight drought	0,4 – 0,55	
Normal	< 0,4	

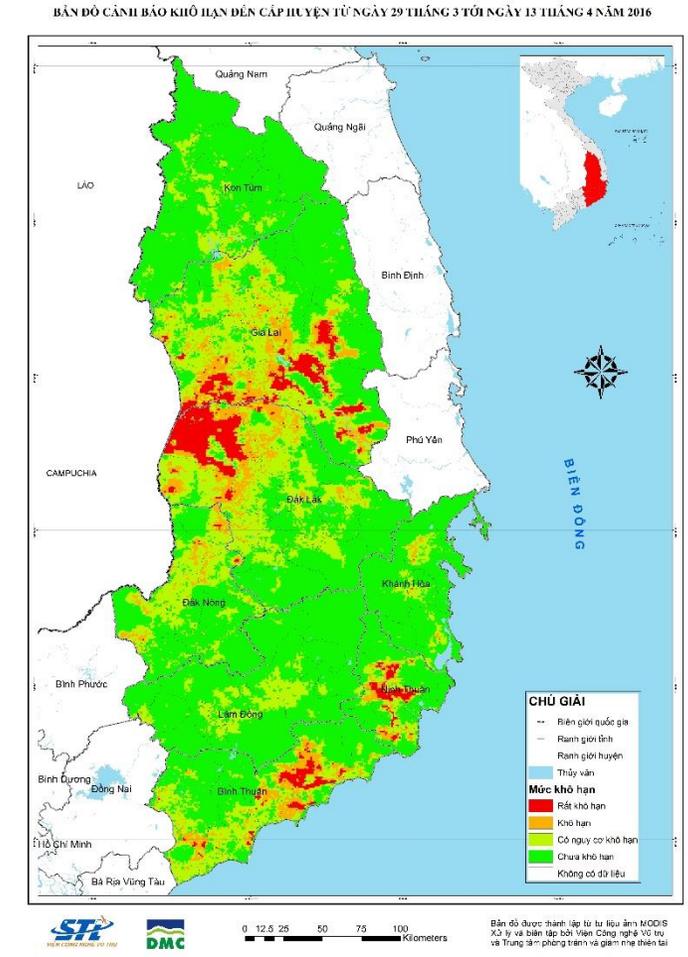
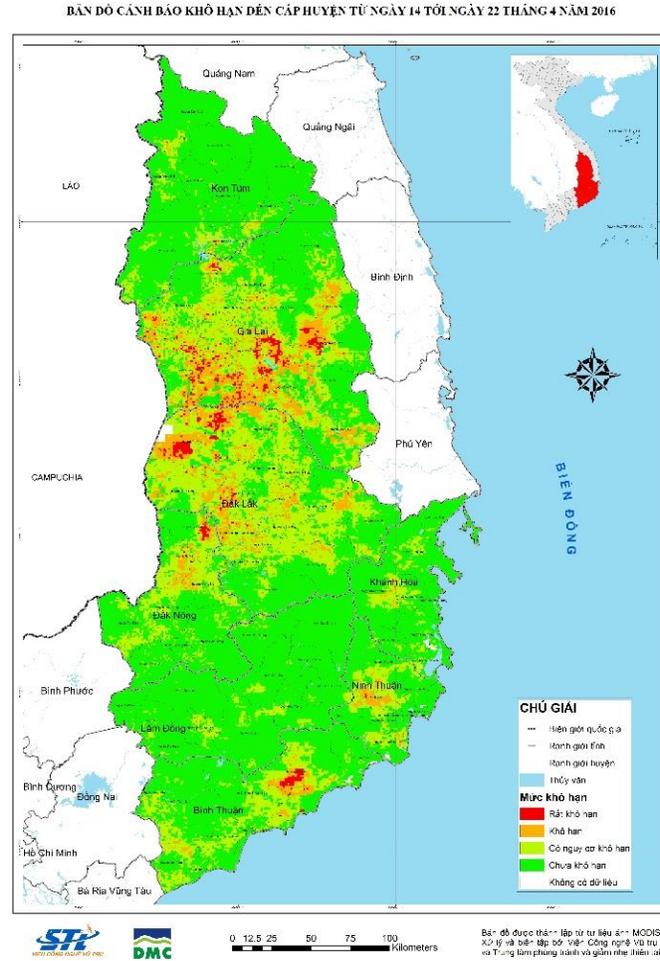


Drought map of Highland area and South Central area on 2015.



(adapted from Mauro E. Hořman và Raúl E. Rivas, 2015)

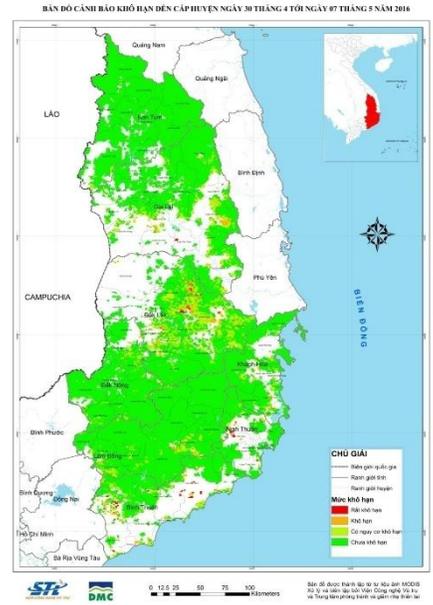
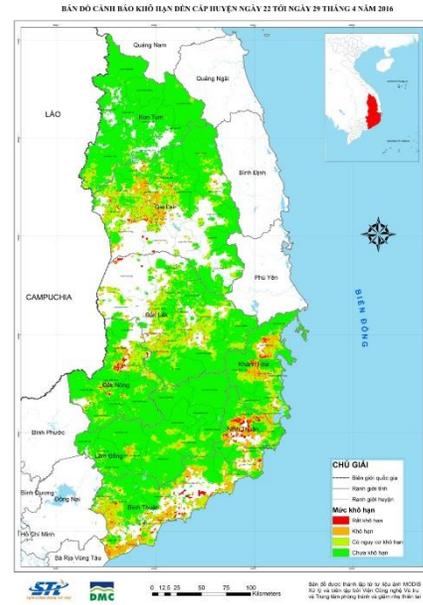
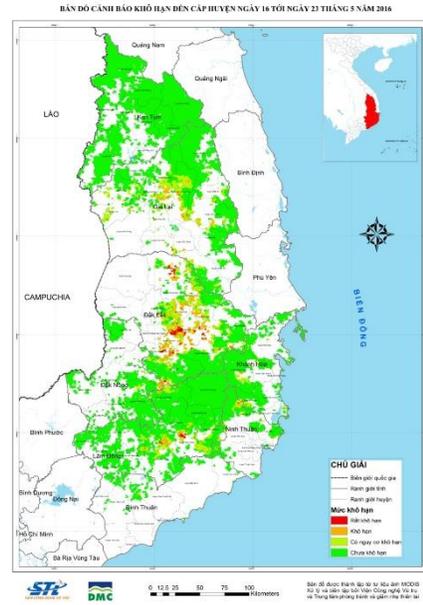
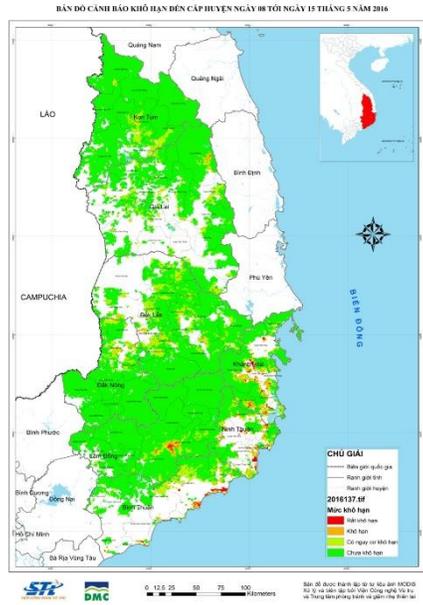
Drought level	TVDI value	Warning color
Severe drought	0,7 – 1	Red
Moderate drought	0,55 – 0,7	Orange
Slight drought	0,4 – 0,55	Yellow-green
Normal	< 0,4	Green



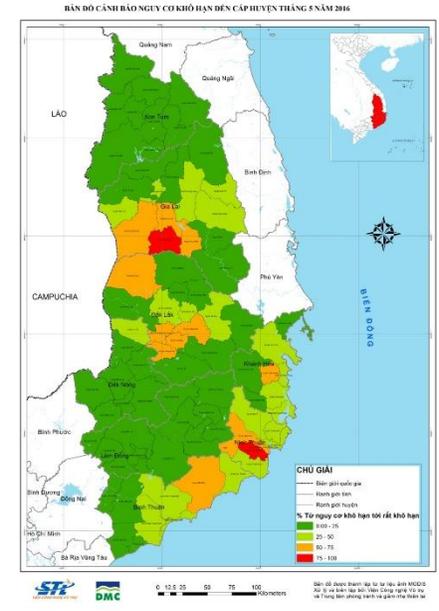
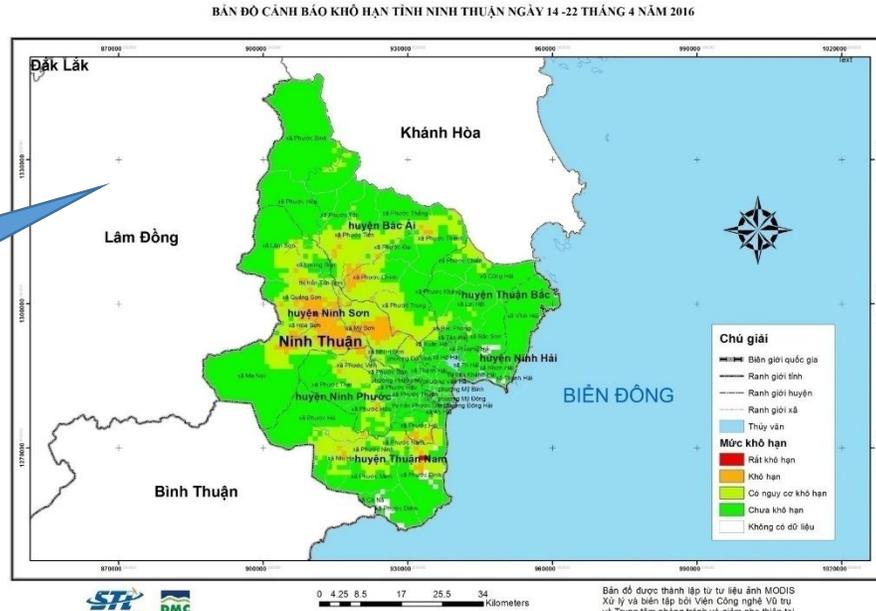
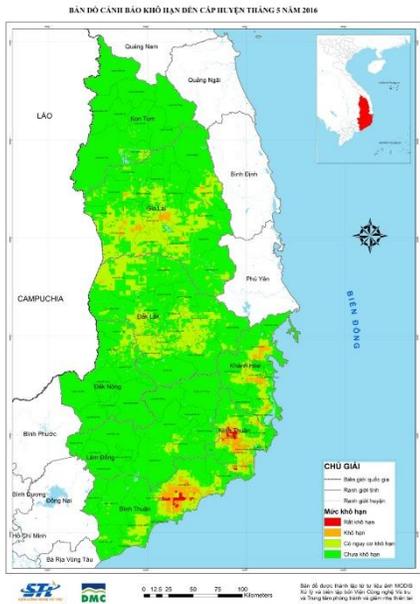
STI and DMC cooperation to produced the drought map for 5 provinces in Highland area and Ninh Thuan, Binh Thuan, Binh Dinh provinces.

Drought on May and June, 2016

Province scale



District scale



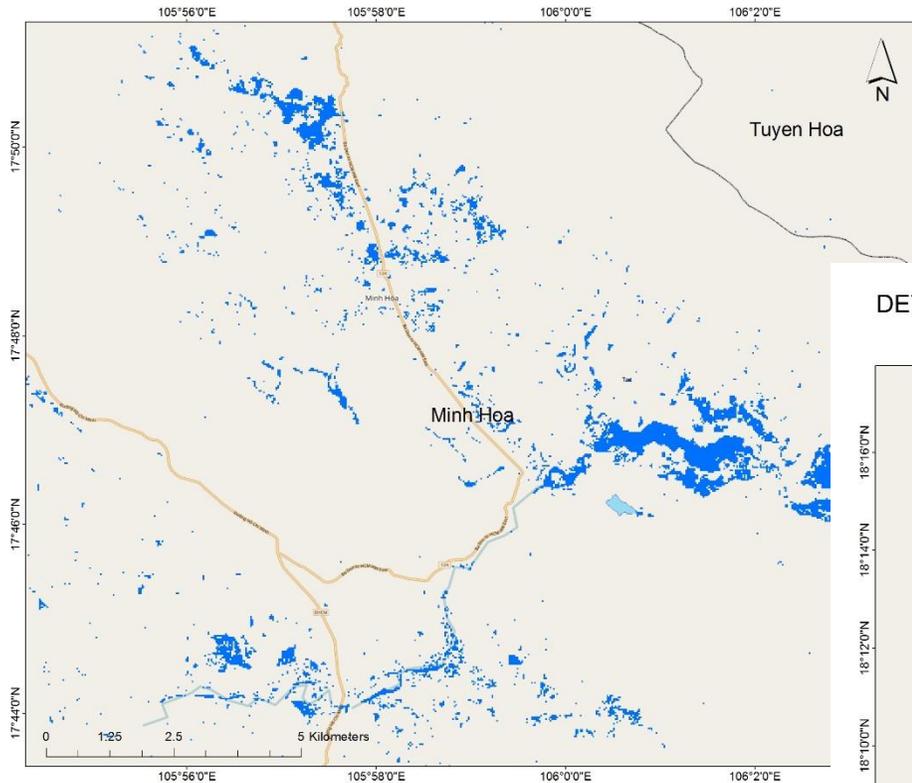
Drought risk maps (5 levels)

THE INNITIAL RESULT

- Emergency response for Flood disaster on 2016

October 2016 DMPTC & STI requested Sentinel Asia AIT processed

DETECTED WATER IN MINH HOA DISTRICT, QUAN BINH PROVINCE, VIETNAM (16 OCT 2016)



Date: 10/19/2016

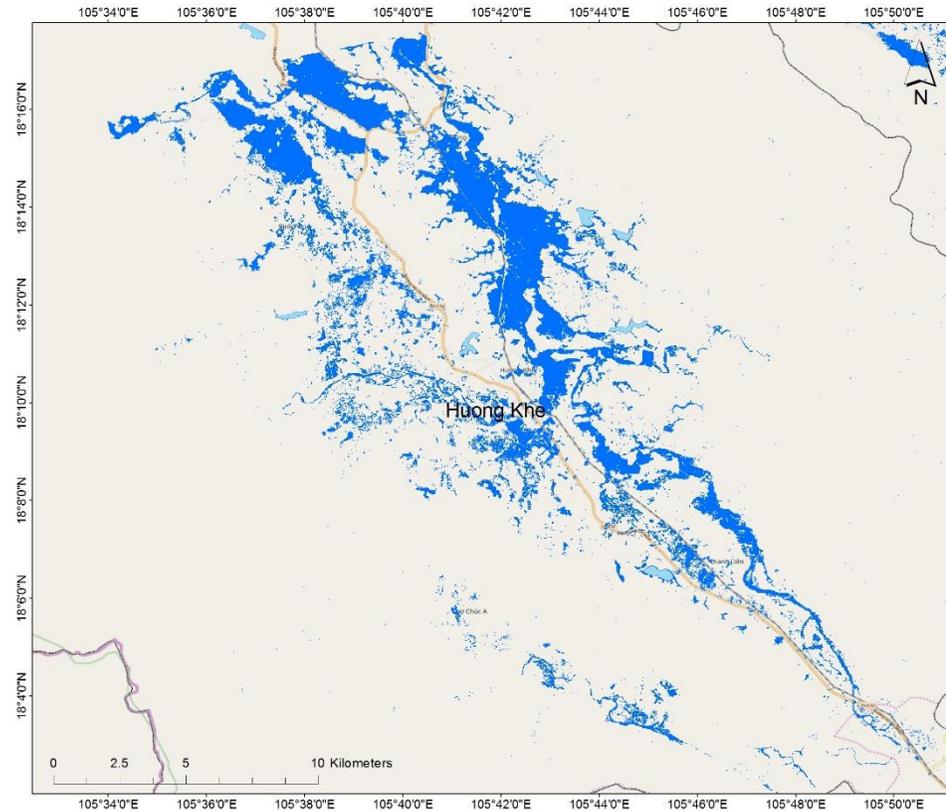
Service Layer Credits: © OpenStreetMap (and) contributors



Legend



DETECTED WATER IN HUONG KHE DISTRICT, HA TINH PROVINCE, VIETNAM (16 OCT 2016)



Date: 10/19/2016

Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA



Legend



MAP SCALE 1:60,000

POST-DISASTER IMAGE

Satellite/ Sensor: ALOS-2/ PALSAR-2
Date: 16 Oct 2016
© JAXA

Coordinate System: GCS_WGS_84
Datum: D_WGS_84
Unit: Degree

This map shows detected water area in Huong Khe district, Quan Binh province, Vietnam as observed from ALOS-2 data on 16 October 2014. Image processing using thresholding technique was applied to extract the water area.

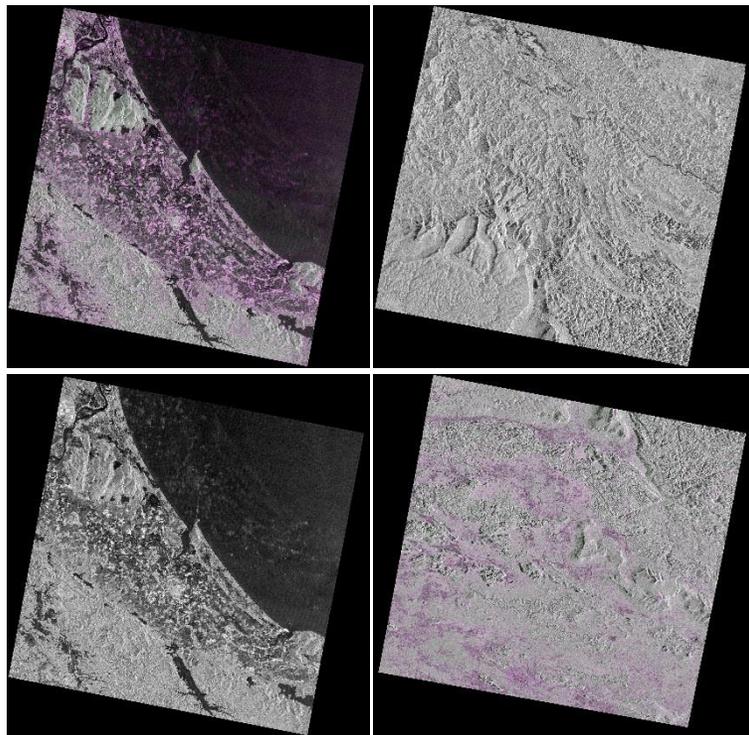
Disclaimer: The accuracy of this product is not validated.



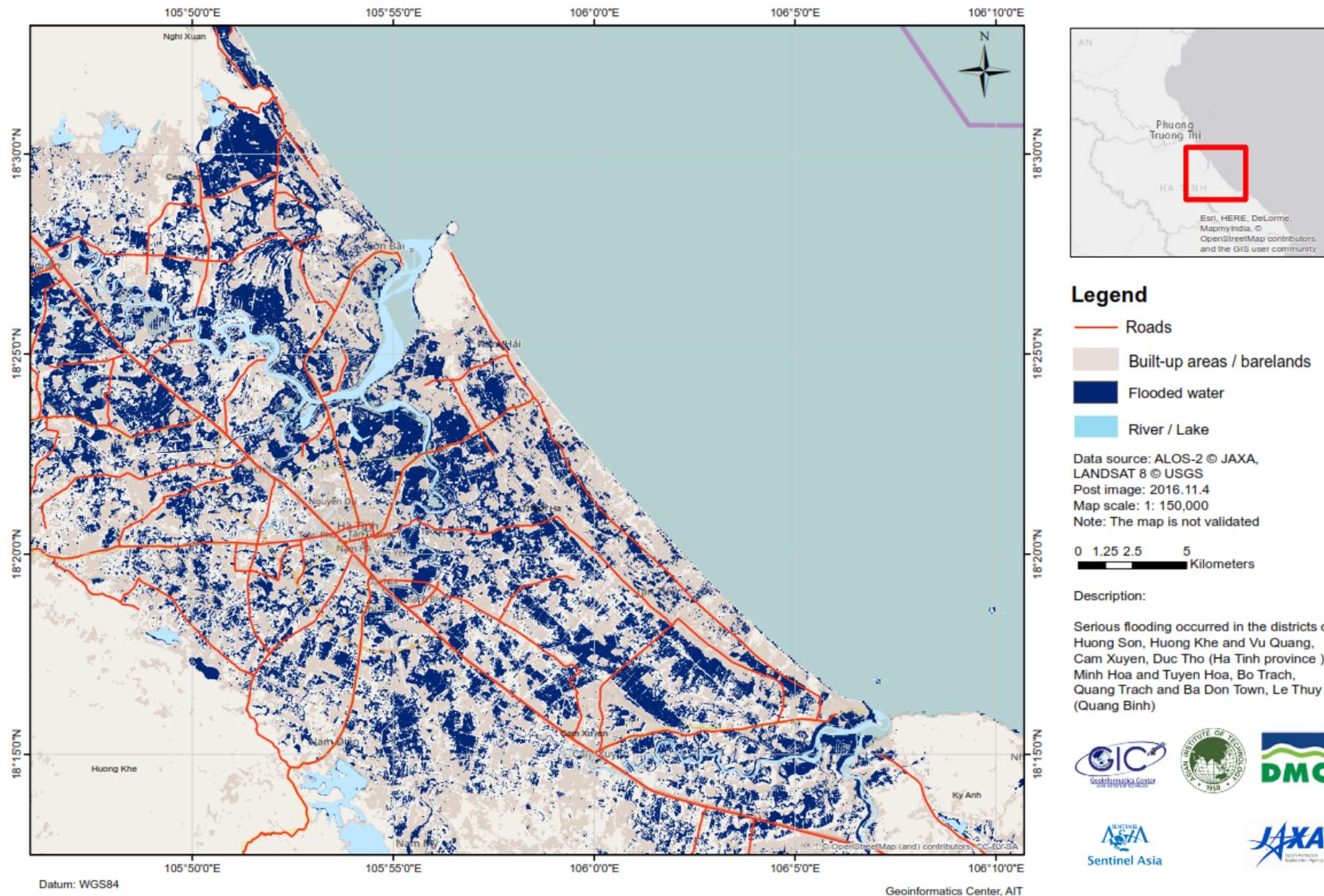
November 2016

DMPTC & STI requested Sentinel Asia

AIT processed

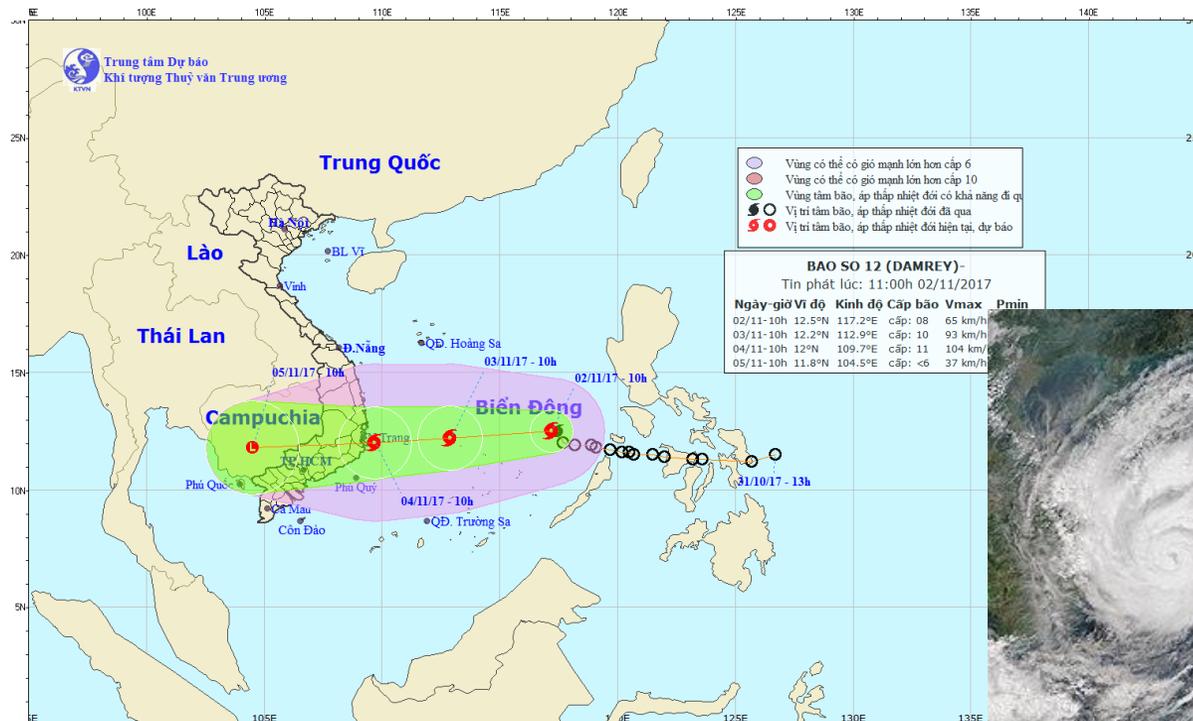


Map 1.1 : Existing Water Detected by ALOS-2/PALSAR-2 Images observed on 04/11/16 in Central of Vietnam



THE INNITIAL RESULT

- Emergency response for Damrey storm (Storm No 12) on Nov 2017:

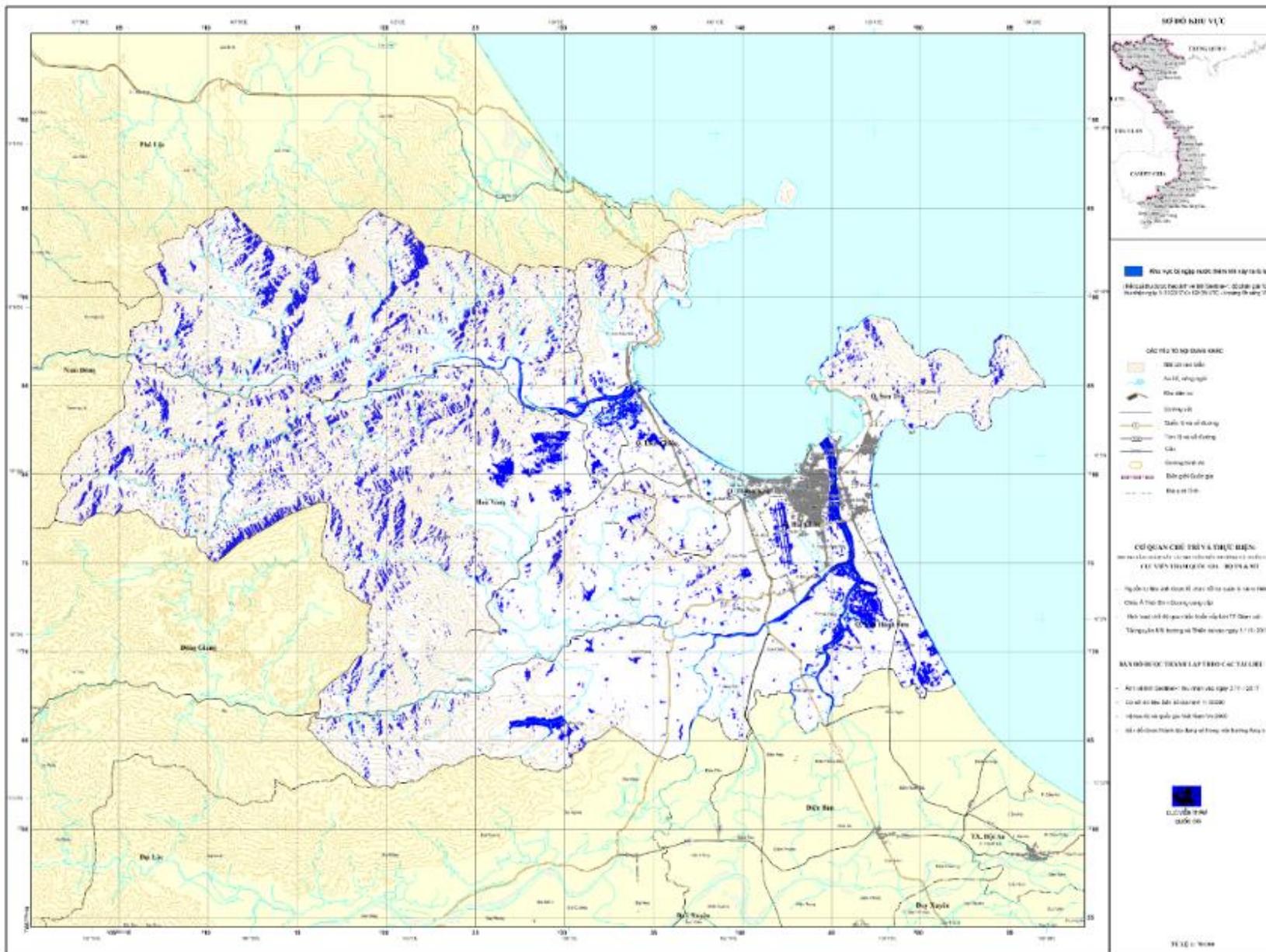


Report form CCNDPC on Nov 11th 2017:

- People die: 44
- People lost: 19
- House damage: 116.224



BẢN ĐỒ GIÁM SÁT NHANH HIỆN TRẠNG NGẬP LỤT
KHU VỰC TỈNH ĐÀ NẴNG NGÀY 3/11/2017



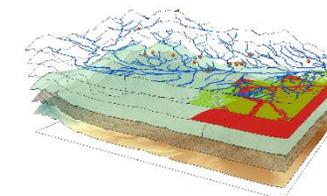
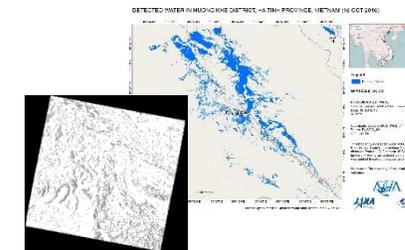
Flooding map in Da Nang city using Sentinel-1 on Nov 3th 2017. Product made by Centre for Monitoring of Environmental resources and Natural disasters – Department of National Remote sensing - MONRE



Advantage and disadvantage

Advantage

- ✓ MARD and VNDMA would like to improve the applying of space technology in DRR
- ✓ DMPTC had been connected to Sentinel Asia and International Charter system
- ✓ DMPTC had technical officer with the knowledge about DRR system and Remote Sensing and GIS
- ✓ Strongly supports from STI, AIT, Sentinel Asia; and UN-Spider

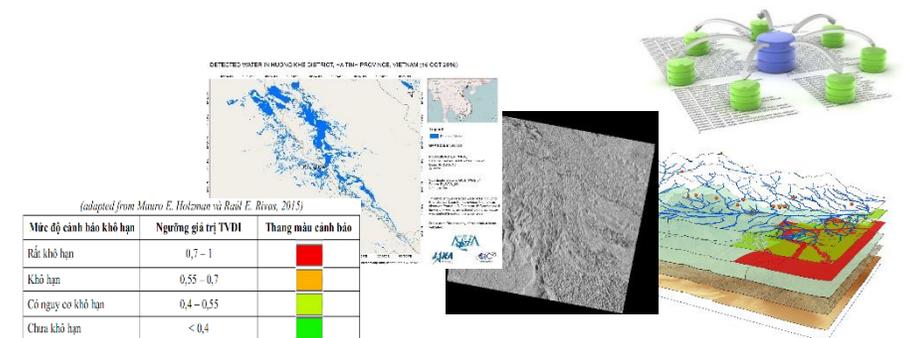


Disadvantage

- There are still have no SOP for applying space technology in DRR, especial in emergency response
- The officer need more technical training for space technology, advanced technique on how to use space technology in case of emergency response.
- Need building the database that include base map and other geographical maps to serve for disaster management.

RECOMMENDATION

- It should have SOP and clear responsibilities for each participate site: provider, user and technical analysis.
- Sharing method to quick delivery satellite images and products to end user in case of disaster occur, especial is emergency response.
- Research on building the remote sensing database to serve for disaster management or portal library to quick sharing product, data between Vietnam technical organization belong to DANs, PDANs, Node... and other disaster organization.



THE END

THANK YOU FOR LISTENING

